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Philosophy of Technology in the Jesuit University

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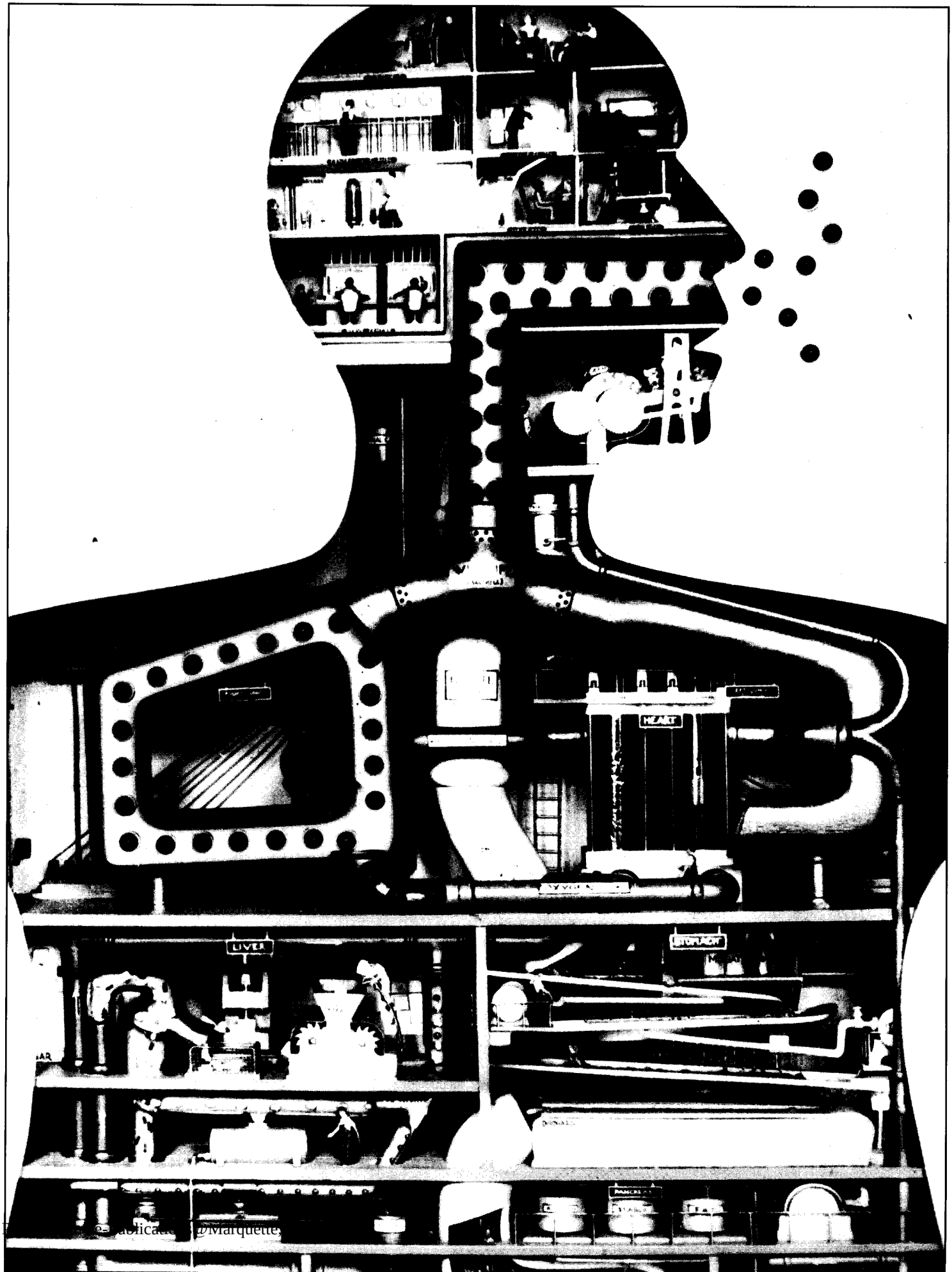
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Philosophy of Technology in the Jesuit University

TIMOTHY CASEY

The question concerning technology is akin to St. Augustine's famous question in the *Confessions* about time. We all know what it is until we are asked to define it. The very fact that our lives are so deeply immersed in machines and a machine mentality today allows technology to slip into the background, unnoticed and yet presupposed in almost everything we do. Out of this thoughtlessness about technology grows our common-sense understanding of it; namely, that machines are simply tools we use, employable for good or ill depending solely on the virtue of their users or consumers. No matter the awesome power they possess. As long as we keep in mind what they are for and limit them to their status as means, problems will be kept to a minimum.

This apparently reasonable characterization of technology is what philosophers call the *neutrality thesis*, an influential ideology that tends to stultify serious reflection on our mechanistic world. Anyone desiring confirmation of this benign view of our technologies has only to announce that he or she has banished television from the house. The response, in my own experience, will range from accusations of neo-Luddism to charges of child abuse. Indeed, not to own a television set is considered downright un-American (the word a good friend actually used in an attempt to shame me into purchasing a Sony). And yet, as anyone with children knows, even the briefest of encounters with the tube induces a kind of hypnotic trance that, given enough time, develops into a soporific state not unwelcome to parents in need of a cheap and readily available babysitter. Philosophers of technology spend a lot of time reflecting on such technologically induced behavior and have concluded, in opposition to the neutrality thesis, that all technologies—from the humblest craft to the most sophisticated hi-tech—bring with them certain ways of viewing and valuing the world. Just how this occurs and why, as well as whether the kinds of viewing and valuing inherent in any technology are good or not, are the core questions in the philosophical discussion of modern technology.

The question *What is philosophy?* has always been a difficult and elusive question for philosophers, but let me offer a tentative answer to that question, in the interests of defining what I mean by philosophy of technology. Philosophy is the raising of questions, the transformation of the most commonly held certainties into vexing conundrums. But what, specifically, does philosophy put into question and how does it do it? The first part of that question is easier to address than the second part: philosophy—exasperating as it may sound—questions *everything*, including, as I suggest above, itself. This questioning is a historical process, an ongoing dialogue that progresses as the world changes and as philosophy responds to and helps shape that change. The activity of philosophy must always be viewed in its historical context.

As a philosopher at a Jesuit university, I have found this way of conceiving and doing philosophy supported and nourished by the Jesuit readiness to engage the world on its own terms but in a critical fashion. Hence, I have felt the need to pose philosophical questions of an ethical, political, and metaphysical nature to technology and to place these questions in a larger context than is accessible to most users and producers of technology in everyday life. This approach is valuable because it shows how technology is

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related to everything else in the world as we understand the world and our place in it at this time in history. What I've discovered in my own reflection is that *an inherent tension exists between technology and philosophy*, similar to the uneasy relationship between Christianity and the world. Common sense tells us that technology is a problem-solving enterprise. Its purpose is to find answers to specific kinds of questions (for example, questions about survival and quality of life) that have continually been raised throughout the history of humankind. Philosophy, on the other hand, is a question-raising activity; it is more interested in uncovering and fleshing out problems than in solving them. At times philosophy can seem to be antagonistic or even obstructionist toward technology, hostile or at best indifferent to its achievements. While there is some truth to this perception (and the same could be said of philosophy's relation to whatever else it questions, as the historical example of Socrates dramatically proves), the fact that technology and philosophy perform irreconcilable functions does not mean that they are irreconcilably opposed. To see why this is so and why it would be intellectually and morally irresponsible to ignore the impact of technology on our world requires first of all that we examine what philosophy has traditionally said about technology.

The History of the Philosophy of Technology

Although the philosophical study of technology was not explicitly identified until the middle of our own century, a long tradition in the history of philosophy has reflected on matters technological. Both Plato and Aristotle raised the issue of what the Greeks called *techne*—their word for skill in any making or producing—and almost invariably related it to the more encompassing ethical, political, aesthetic, and metaphysical themes of their thought. Plato, in particular, wrote about the danger of a *techne* debased into a mere technique or formula for achieving results divorced from any sense of the common good or larger cosmic order. Plato's fear was of a mechanized kind of thinking that laid itself open to sophistry, political tyranny, and the shallow hedonism that always seems to accompany falsehood and injustice. Sts. Augustine and Thomas Aquinas continued in this vein, albeit in more explicitly religious ways, and extended the philosophical concern with *ars* (art or skill) through the Middle Ages and into the modern world, where it was taken up and transformed by such thinkers as Bacon, Descartes, Rousseau, and Marx. Bacon, of course, technologized the ancient conception of *episteme*, claiming that "knowledge is power" and therefore must be directed to the "relief of man's estate" (as succinct a formulation of the meaning and thrust of modernity as one can find). Only Descartes's technological rendering of natural science as "the mastery and possession of nature" captures as well the thoroughly technological flavor of the modern age.

Oddly enough, however, it is precisely when technology began to take on an epistemological and metaphysical importance heretofore unseen in Western civilization that it receded into the background of philosophical thought and took on that aura of neutrality that has become so commonplace for us today. To be sure, one can point to exceptions to this rule. Pascal lamented in the seventeenth century that *l'esprit de finesse* had been replaced by *l'esprit géométrique*. One hundred years later, Rousseau indicted the rational intellect and the commercial culture it had created. These critiques constitute a small but not insignificant strain of protest against an instrumental conception of reason that reduces science (and hence all knowledge) to mathematical calculation and technology to mere efficiency, unconnected to human needs and natural limitations. But it is really not until the nineteenth-century, romantic reaction to the Industrial Revolution—after Blake's "dark, Satanic mills" and in the age of Dickens's unforgettable depictions of the squalor of industrialized towns—that philosophy returned to a more critical stance toward technology, especially in the work of Marx.

Unlike the ancient Greeks, medievals, or even early moderns, Marx (along with Benjamin Franklin!) defined humans as tool-making animals and situated what he called humanity's "species essence" in technological activity. "Men," he says in *The German Ideology*, "begin to distinguish themselves from animals as soon as they begin to produce their means of subsistence," and such means are produced within a social and political context. Conversely, the social and political are always explained in terms of historical modes of production and the kinds of technology and social organization that ultimately distinguish these economic modes. In placing technology at the center of human history, Marx at once looks back to the Platonic warning about the reduction of *techne* to sheer technique and ahead to a world where technology, properly employed, will abolish scarcity and the material conditions of injustice. An ambivalence thus runs through his thinking, critical as it is of industrial capitalism and yet hopeful of a coming automated, socialist paradise. As a result, his characterization of technology is in many respects negative, even as technology is seen fulfilling humanity's species essence. Marx is, in short, both romantic Luddite and uncritical technophile, mirroring in an important way for us the essential dilemma of modern technology.

In *Das Kapital*, Marx defined technology or, as he called it, the "labor process," as "human action with a view to the production of use-values, appropriation of natural substances to human requirements," such values and requirements being the rather ordinary human ends and purposes that traditionally guided the making of useful artifacts. The capitalist development of industrial technology effectively replaced these use-values with exchange- or market-values as the goal of technological production, subordinating human needs in the process to the necessities of the bourgeois economic order. In order to make a profit and accumulate capital, it thus became necessary to ignore the appropriate uses of artifacts in favor of techniques that enhanced efficiency and large-scale modes of production, a situation which led to widescale degradation of the workers and the environment. (Interestingly, Marx is one of the first to make the environment an issue, though his solution goes only to the social organization of production and not, in my opinion, to any meaningful changes in the means of production. The environmental rape of Eastern Europe and the former Soviet Union would seem to bear this

judgment out.) In the end, he believed that this tragic and fateful inversion of priorities could—and inevitably would—be reversed in a communist arrangement where once again humane values, and not market-driven ones, would assume center stage.

Twentieth-century philosophy of technology draws upon these rich historical sources from Plato to Marx as it gropes for new ways to understand radically new technologies and a world that is increasingly shaped by them—for better and for worse. We can identify several distinct strains in contemporary philosophy of technology that not only analyze and study technology in substantially different ways but also reach different conclusions about the value of technology and its proper place in the life of society and the individual. The question, as I see it, is not simply whether one is a technophile or a technophobe. The issues are too complex and subtle for such reductionism. One can say, rather, that some philosophers are more sanguine than others about the direction (or directions) in which technology seems to be taking us, and hence are more positive about the implications of its prominence in an increasingly Westernized world.

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Not surprisingly, recent philosophies of the more optimistic sort arise out of an engineering perspective in philosophy that has its roots in the nineteenth century. Two instructive examples are the techno-philosophy of the contemporary Argentine philosopher Mario Bunge, and the transcendental approach of the German engineer Friedrich Dessauer. Bunge's techno-philosophy is part of his larger "scientific philosophy," which involves a scientific-technological understanding of nature as well as of the human world, including moral and political behavior. Dessauer waxes even more scientistic and sees technology as the transcendental key that unlocks the mysteries of existence. Going beyond the limited questions of the material and practical benefits of technology, Dessauer claims for it a moral and even mystical significance. One has only to reflect on the profound metaphysical and ethical issues opened up by genetic engineering as it approaches nearer and nearer to the mysteries of life to see what Dessauer is getting at: namely, that technology does more than abolish scarcity and raise standards of living. It allows human beings to participate in the unfinished creation of the world and thereby to attain a life previously reserved for the gods.

A more critical, sober evaluation can be found in the social-critical analyses of the French sociologist and theologian Jacques Ellul. His approach can be traced to one side of Marx's thought, the side that criticized the modern technological replacement of use-values with exchange-values. But, unlike Marx, Ellul is skeptical of a remedy that ignores the dynamics of technology itself apart from its employment in a particular economic or political ideology. Ellul is noted for his negative assessment of what he calls "technique," the one best means available to solve a problem in the most efficient way possible. Technique is a phenomenon which is not limited to the strictly technological. It can be found in all areas of human life—including politics, ethics, sports, science, and education. Contrary to Bunge, who sees the pervasiveness of the technical as a good thing, Ellul lays many of the moral, religious, and environmental ills that plague us at technique's doorstep. The significant role of propaganda in contemporary politics, advertising, and the media, the essentially manipulative character of the media and image-making

NATURE IS CURRENTLY PERCEIVED, IN HEIDEGGER'S VIEW, AS A "STANDING RESERVE," A STOCK OR RESOURCE WHOSE ONLY JUSTIFICATION FOR BEING IS ITS USEFULNESS TO THE TECHNOLOGICAL SYSTEM.

that has infected both modern democracies and totalitarian movements in the twentieth century. The only solution to these kinds of problems is not more technique (the infamous technological fix) but, instead, a radical delimiting of the technical that, for Ellul, can only be accomplished through a religious transcendence of the modern world and all its secular temptations.

A third contemporary approach to modern technology is humanistic in the broadest sense of that term. It is represented by a host of continental philosophers such as Henri Bergson, Karl Jaspers, Jose Ortega y Gasset, and Gabriel Marcel, and has its roots in both romanticism and the Platonic and Aristotelian reflections on craft technology. The most important member of this group is the German thinker Martin Heidegger, who most forcefully articulated the romantic critique of technology while going beyond its naive rejection of the industrial world. It was Heidegger who brought the theme of technology into the mainstream of contemporary philosophical thought and made it a question of pressing importance. Heidegger argues that technology is more than just a tool or instrument at our disposal (the neutrality thesis). At a deeper level, it is a significant part of our "being in the world" and hence determines in large measure how we relate to the world. Technology, in other words, has much to do with how we see, value, and know the reality around us. Nature, for example, is currently perceived, in Heidegger's view, as a "standing reserve," that is, as a stock or resource whose only justification for being is its usefulness to the technological system. Nature is "valuable" only to the extent that it yields energy sources vast enough to feed our machines and rapidly increasing population. Whether humans have also been taken up into this reserve is a further—and more troubling—question Heidegger raises.

In the same breath, one should also mention the renowned American critic of technology and modern urban life, Lewis Mumford. Although he was not a professional philosopher by training, Mumford brought a philosophical acumen to his wide-ranging studies in architecture, city planning, and the history of technology. While he took his immediate departure, like Heidegger, from romanticism (in his case, Emerson, Thoreau, and Melville), his thinking more deeply reflected the classical insistence that technology be situated in and guided by moral, political, and metaphysical ideals and norms. The extent to which modern technology has broken loose from these norms—and perhaps has been a major force in eroding them—is the extent to which Mumford has subjected it to a withering (and undeniably Platonic) critique. His criticism, for instance, of modern architecture's adoption of a "machine aesthetic" (those sleek boxes of glass and steel) quite persuasively demonstrates the dominance of purely technical standards not just in modern technology but in the fine arts as well. For Mumford, modern technics no longer serves the aims and values of life. It is death-dealing and one-dimensional in its social and, especially, environmental effects. Though he was a great lover and student of technology and urban culture, he came to the view late in his career that Western civilization had tipped the balance too far in favor of the mechanical over the organic and the artificial over the natural. (In the field of architecture, again, Frank Lloyd Wright was his hero and upholder of the anti-modernist ideal of organic design and building.) Modern technology, he sadly concluded, had lost contact with

those humanistic sources and traditions that had previously defined its greatness and had actually made possible our current scientific and technological achievements.

Major Issues in Philosophy of Technology

Clearly, then, the philosophical response to modern technology, though slow in coming, has not been lukewarm. Most philosophers today emphatically reject the neutrality thesis. Indeed, although it was Heidegger who most explicitly and forcefully challenged the purely instrumental status of technology, it is not difficult to see that in one way or another virtually all the major philosophical accounts of technology treat it as more than simply a tool at our disposal. Bunge discerns in modern technological activity the key to a new interpretation of human existence, while Dessauer goes even further and perceives a breakthrough toward a new metaphysics. Ellul, on the other hand, while also confirming the far-reaching consequences of "technique," bemoans its existential and metaphysical impact and seeks ways to mitigate its deterministic character. Regardless of their evaluative stances, most philosophical observers agree that modern technology has decisively, though sometimes subtly, shaped the way we live and the world we live in.

More recently, Langdon Winner has posed the question of the neutrality of technology from a political point of view. In an essay whose title bears the question, Winner asks, "Do artifacts have politics?" In making the case that they do, he relates the fascinating but disturbing story of the low-hanging overpasses found along

Recommended Reading

(See also the works cited at the end of this essay)

Albert Borgmann. *Technology and the Character of Contemporary Life: A Philosophical Inquiry*. Chicago: University of Chicago Press, 1984. A Heideggerian rendering of the distractions of modern technological life and the need to reestablish "focal concerns."

Robert Brumbaugh. *Ancient Greek Gadgets and Machines*. New York: Thomas Crowell, 1966. An engaging look at ancient Greek attitudes toward technology and invention.

Paul Durbin, ed. *A Guide to the Culture of Science, Technology, and Medicine*. New York: Free Press, 1980. An impressive sourcebook on the history, sociology, and philosophy of science and technology.

Samuel Florman. *The Existential Pleasures of Engineering*. New York: St. Martin's Press, 1976. The brighter side of technology and its practice.

Don Ihde. *Technics and Praxis: A Philosophy of Technology*. Boston: D. Reidel, 1979. A clear and concise phenomenological account of human-machine relations.

Ivan Illich. *Tools for Conviviality*. New York: Harper and Row, 1973. A call for a return to technological simplicity and living lightly upon the earth.

John McPhee. *Encounters with the Archdruid*. New York: The Noonday Press, 1971. A lively introduction to environmentalism and the ecological issues presented by modern technology.

Carolyn Merchant. *The Death of Nature: Women, Ecology and the Scientific Revolution*. San Francisco: Harper & Row, 1980. A historically informed argument for the connection between the modern domination of nature and the oppression of women.

Carl Mitcham. *Thinking Through Technology: The Path between Engineering and Philosophy*. Chicago: University of Chicago Press, 1994. An in-depth look at contemporary philosophy of technology.

Carl Mitcham and Robert Mackey, eds. *Philosophy and Technology: Readings in the Philosophical Problems of Technology*. New York: Free Press, 1983. Still the best anthology available, with essays ranging from science, morality, and politics to metaphysics, religion, and the environment.

Jose Ortega y Gasset. *The Revolt of the Masses*. New York: W.W. Norton & Company, 1957. A classic account of technological levelling and the rise of mass culture.

Friedrich Rapp. *Analytical Philosophy of Technology*. Boston: D. Reidel, 1981. A systematic analysis of modern technology by an engineer with a keen analytical eye and a humanistic sensibility.

John M. Staudenmaier, S.J. *Technology's Storytellers: Reweaving the Human Fabric*. Cambridge: MIT Press, 1985. A genial introduction to technology and its history.

Lynn White, Jr. *Medieval Technology and Social Change*. Oxford: Oxford University Press, 1962. A scholarly look at how the invention of the stirrup, the plow, and the three-field crop rotation system led to chivalry, feudalism, and a revolution in Western humanity's attitude toward nature.

the Long Island parkways constructed by the late Robert Moses, New York City public works commissioner. According to Moses's biographer, Robert Caro, these shorter-than-normal overpasses discouraged bus traffic on the roadways, thus making Jones Beach inaccessible to African Americans and other poor minorities, but not to upper- and middle-class whites who tended to travel in private cars. The lesson of the Moses tale lies not in the evil that a powerful technocrat can wreak upon an unsuspecting community. Rather, it shows the way in which a fairly benign and mundane technology can deform an aspect of social reality and exacerbate an already unjust political situation without causing so much as a ripple of protest or—what is even more amazing—even the slightest recognition of what is happening. Nor does it really matter in the end whether Moses actually intended to bring about such an effect through the arts of city planning and engineering. (It is, in fact, questionable whether he did.) The point is that technology has a multitude of consequences, many of which are unintended and go unnoticed, and most of which, when they are noticed, are usually attributed solely to the intentions of the producers or users of the technology and not to the artifacts or techniques themselves. This blindness in the face of the social and political ramifications of our artifacts can be traced to another rather common but misguided conception of technology as *applied science*, a definition which continues to hold considerable sway outside of history and philosophy of technology circles. This misconception is rooted in the fact that around 1850, technology joined forces with modern science, first in the chemical and electrical industries and later in areas like medicine, computers, and genetic engineering. In a certain limited sense, modern technology can be roughly described as the practical application of chemistry, physics, and biology. But this is only a partial truth. Technology, in point of fact, is much older than modern science and actually developed into what we know as modern industrial technology quite separately and distinctly from science. It can even be argued that science was often more dependent on technology than technology on science. Where, after all, would Galileo have been without the telescope, Leeuwenhoek without the microscope, or Harvey without the technological metaphors of pumps, valves, and mechanical motion? A moment's reflection will confirm the thoroughgoing technological character of science today, from its reliance on computers and a whole array of high technology, to its funding for ultimately technological purposes (defense, medicine, communication, and transportation) and its justification in the public eye as a fundamentally technological activity. Like it or not, we now live in a Baconian age: knowledge is power and can only legitimate itself as such.

Technology has also had a profound metaphysical impact on modern science. In what is perhaps his best known and most influential essay, "The Monastery and the Clock," Mumford establishes a connection between the medieval invention of the mechanical clock and the subsequent development of the modern scientific world view. Aside from its immediate practical advantages, the clock engendered a new conception and experience of time, one that objectified temporality by turning it into discrete, measurable bits that could literally be "seen" as the hands moved inexorably and mechanically around the face. Separating time from the everyday concerns and (mainly agricultural) activities of human beings—from activities that were traditionally tied to the cycles of the earth—the mechanical clock made possible a belief in an objective reality of sheerly quantitative entities (seconds, minutes, and hours). This belief, according to Mumford, helped produce the mathematization of nature that defines the modern Scientific Revolution and that later would serve as the theoretical underpinning for modern technology's reduction of nature to Heidegger's "standing reserve."

These and other examples show that technology is more than just an instrument subservient to larger cultural purposes. It has come to shape those purposes more and more even as it seeks, as it has always done, to transform nature for purely practical reasons. While scientists continue to seek knowledge for its own sake, it has become clear that these theoretical pursuits can no longer be understood apart from the technological imperative that drives them. Whether this situation is desirable is another question. The old, entrenched ideas about technology as a neutral phenomenon and a piece of applied science no longer hold up to philosophical or historical scrutiny.

Continuing Debates in Philosophy of Technology

Although there is general agreement concerning technology's non-neutrality and relative independence from science, there are a number of unsettled questions in this young field. Three of these stand out as most persistent and prominent in the literature: technology's alleged *autonomy*, its *relation to nature*, and its ultimate *beneficence or harm*.

Certainly the most provocative question raised in recent years has been the question of control. Who, if anyone, controls modern technology? Another way of approaching this issue is in terms of the meaning and possibility of a "technological determinism." A soft determinism would hold that while certain kinds of technology tend to encourage us to perceive and act upon the world in certain ways, we can resist such forces and oppose other, non-technical values to the instrumental values being thrust upon us. A hard determinism would deny that we can act freely outside the technological system and would contend that technological forces and values have taken over even to the point of what some have called the "Frankenstein phenomenon." Like most of my colleagues in philosophy of technology, I fall somewhere on the continuum between a soft and hard determinism. I take planes to conferences, write my papers on a word processor, and fax urgent messages and documents to friends and colleagues. On the other hand, I am aware of how modern transportation flattens my sense of space and geography, how composition on a computer dulls the care I take in writing, and how the instantaneousness of the fax inclines me to put off projects till the last possible minute. And I suspect that more than a few of us are now grappling with the advent of e-mail and its discouragement of letter writing. On a global scale, the conquest of space and time has, we tell ourselves, enhanced communication and created the "global village" that will, we hope, lead to greater peace and prosperity. We are thus willing to tolerate—and even to ignore, though it is becoming

more difficult—the time wasted in traffic or in just milling about airports waiting for our connections. We are inclined to excuse the growing intrusions of privacy that daily occur from the telephone, just as we remain convinced that the computer and the fax will serve the cause of individual freedom—as they did so spectacularly in the fall of Communism in eastern Europe—rather than the cause of social and political control. But even ordinary people are beginning to ask the question: How much do we really control our devices and the systems that keep them running? Do we really have a choice as to whether or not we want them in our lives?

Critics also point to the time, effort, and money needed to maintain these devices. While their invention and initial construction were certainly the efflorescence of human freedom and intelligence, the technological imperative to keep them in working order and to improve on their performance seems increasingly to crowd out other ostensibly less useful, but possibly more satisfying and important human endeavors. Simply compare the money that goes to space and defense with the paltry governmental support for the arts and humanities. While no one would argue that the standard of living enjoyed in, say, the Middle Ages even approaches that of the twentieth century (at least in the first world), it is also true that we work more today than our ancestors did. As a consequence, we seem to have lost a sense of festivity and true leisure, which, if Aristotle is right, is more active than work and more engaging than simply making a living. Hannah Arendt tells us that during those allegedly benighted Middle Ages, "it is estimated that one hardly worked more than half the days of the year. Official holidays numbered 141 days . . . . The monstrous extension of the working day is characteristic of the beginning of the Industrial Revolution, when the laborers had to compete with newly introduced machines." The contemporary Catholic thinker Josef Pieper connects this loss of leisure with the modern disenchantment of the world and the disappearance of the sacred. Paradoxically enough, the destruction of leisure has been due in some degree to the introduction of labor-saving devices into our lives.

LIKE IT OR NOT, WE NOW LIVE IN A BACONIAN AGE: KNOWLEDGE IS POWER AND CAN ONLY LEGITIMATE ITSELF AS SUCH.

Implicit in the question of technology's alleged autonomy is the more thorny problem of how we judge and evaluate it. Very simply, we want to know whether modern technology is good or bad. Does it help to promote prosperity, health, moral values, political freedom, and individual self-fulfillment? Or is it, in the final analysis, dehumanizing? Does it insidiously corrupt our politics and morality, turning the former into entertainment and image-making and the latter into behavior modification? These are difficult questions, to which there is no one single answer or definitive solution. Indeed, given the all-encompassing nature of technology today, it is not even clear that there exists an adequate moral measure by which to judge it.

In the last twenty-five years, the emergence of the environmental crisis has led to widespread suspicion concerning the overall beneficence of many of our technologies. The fact that the dramatic rise in the standard of living in the West has been accompanied by environmental degradation on a scale unmatched in the past has raised the level of concern and anxiety over the direction and deeper implications of our technological culture. It has also resurrected the panacea of the "technological fix" and the argument that while nature may not be ultimately controllable, it is

nonetheless inhumane to treat it as having an existence that supersedes the pressing needs and desires of a growing population. It is on the environmental front, then, that the ethical and political evaluation of modern technology has come to the fore. Here the issues are clearest and the ramifications most far-reaching. At stake is not just the preservation of an inhabitable environment but a clear sense of our place in the world. Alienation is no longer just a spiritual condition today, but, as Christopher Lasch so eloquently argues, a literally physical rootlessness encouraged by our growing attachment to electronic media and the virtual realities they so easily and readily afford us.

A third, and more vexing, problem not unrelated to our ecologic difficulties is our growing distance from nature and hence our ignorance of "life" in its abundance and variety. Philosophers of technology usually express this revolutionary change in terms of the technological creation of a "second nature" or technosphere that is rapidly replacing the biosphere. The growth of malls and a "mall culture" are testaments to this environmental revolution, as is the ubiquitousness of Walkman stereos, boom cars, and fully equipped campers. We can snatch a small taste of the woods without having to miss out on the Knicks' run for the playoffs. But is this necessarily unhealthy? Or is it part of our evolutionary development to distance ourselves from our biological roots, those very origins that made such advances possible in the first place? Can we even raise such a question without suggesting that human beings return to their pre-historic caves and fuse once again into the cosmic soup from which they are now supposedly alienated?

Another, more philosophical, way of putting this question is to ask about the relation between the natural and the artificial. Nature used to serve as a norm for the artificial; until recently art imitated nature and was subservient to it. The Greeks called this imitation *mimesis*, and believed it essential to fine as well as industrial art. Early attempts at flight humorously dramatize this point but in no way diminish its psychic force throughout history. It is only in the last 150 years or so, when scientifically informed technology began to change the substance of nature and actually introduced artifice into its very being (as we are now doing through genetic engineering), that technology finally ceased to look to nature as its guide in making and producing. Today we can no longer expect the traditional kinds of answers when we ask: What is nature? What is artifice? No longer is it obvious that nature itself is more "natural" than artifice. Certainly biotechnology presumes that we can now manufacture a "new and improved" nature, one that is more conducive to serving the needs and purposes of humanity and less likely to act in ways that are uncontrollable and dangerously unpredictable.

AS EDUCATORS IN JESUIT INSTITUTIONS, WE HAVE AN OBLIGATION TO INTRODUCE OUR STUDENTS TO THE HUMANISTIC AS WELL AS SCIENTIFIC ISSUES SURROUNDING MODERN TECHNOLOGY.

Some Suggestions

Even though philosophy provides answers to many of the questions posed by technology, it has nonetheless raised many more questions than it has answered. This is not unusual. As the *love* of wisdom, philosophy has always sought to engender this love by exposing human ignorance in the face of pretensions to knowledge. In order to love wisdom and desire knowledge, one

must first recognize that they are missing, or at least are in short supply. By questioning the role, value, and consequences of technology in society, philosophy has raised the hackles of a fair number of well-meaning people who see themselves engaged in building a better life for all of us, including our descendants. But it should be said in philosophy's defense that the raising of these kinds of questions is not exclusive to its own sphere. It is the biologist, after all, who raises concerns about global warming, genetic manipulation, and the destruction of rain forests. It is the social scientist who worries about the corrosive effects of the electronic media on our politics and public life. And it is the ordinary citizen who wonders whether she has lost control of the forces that shape her life and the lives of her children. Philosophy, as it has always done, listens in on these questions, assesses them, and makes them explicit so that we can think about them rationally. It has not invented them out of nothing.

As educators in Jesuit institutions, we have an obligation to introduce our students to the humanistic as well as scientific issues surrounding modern technology. Ignatian discernment does not occur in a vacuum. It is engaged with the world in a critical fashion and attempts to arrive at judgments about the world and our place in it based on knowledge and a prudential understanding of how and why the world is as it is. We also need to let our students know that underlying this worldly concern is the bedrock Judeo-Christian belief in the goodness of creation. The world is ultimately good not just because of what it provides for us, but, above all, because it is sacred in the eyes of God. Still, respect for creation has become more difficult in our technological age. It is hard to question the realities of economics and the successes of a technology that increasingly seem to drive not only the world beyond academe, but our universities and colleges as well. Nevertheless, at the heart of an Ignatian respect for the creation, one should expect to find today an environmental awareness and a commitment to preserving what belongs, not to us, but to God.

One way to introduce our students to these concerns is by exposing them to the history of technology, specifically to "externalist" histories—such as Mumford's *Technics and Civilization* or Robert Brumbaugh's *Ancient Greek Gadgets and Machines*—that relate technological development to the larger historical and social contexts that situate technology in a meaningful way. Another avenue is through readings in environmental philosophy and ethics that speak to the goodness and beauty of the natural world as it is experienced in our everyday lives. Without some sense of the historical development of technology and its relation to nature and ourselves, it is difficult to show just how technological our current world is and why this is a philosophical problem that demands serious consideration. It is the task of educators today to make this point clear, both for the technologists and scientists of the future, as well as for the society that must grapple with their successes and their failures.

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